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Our thanks to Steve Kuenzler, a student at Belen High School, for allowing us to use his pen and ink drawing for the cover of this publication.

PLANNING GUIDE FOR

COMPUTER EDUCATION PROGRAMS

IN ELEMENTARY AND SECONDARY SCHOOLS

IN NEW MEXICO

January, 1984

NEW MEXICO STATE DEPARTMENT OF EDUCATION
Santa Fe, New Mexico

LEONARD J. DE LAYO
STATE SUPERINTENDENT OF PUBLIC INSTRUCTION

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A NOTE TO EDUCATORS

In response to requests from many interested individuals, the State Department of Education formed a committee to study issues related to computer education in the schools. The result of that study is this computer guide, a document designed to assist local board of education members, administrators, teachers, and parents to better understand the processes involved in planning a computer education program.

For those who have not initiated a computer education program, this guide should be beneficial in helping you to plan the program and to find available resources. For those who already have a computer program, I hope you will find the listing of resources helpful.

I would like to acknowledge the work of the State Department of Education's computer committee in studying the issue and developing the guide. Committee member included:

Bill Trujillo, Chairperson
Nina Bradshaw
Ruth Fletcher-Brown
Win Christian
Judith Kraft
Jack McCoy
Albert Zamora

I also would like to thank Dr. Susan Brown who did the final editing and production of the guide.

ALAN D. MORGAN
Assistant Superintendent for Instruction

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INTRODUCTION

In response to requests from school district personnel, the instructional staff of the State Department of Education (SDE) has developed a planning guide for computer education programs in New Mexico's public and private schools. The need for such a guide is demonstrated by several developments in our society.

--The computer revolution is here, and educational institutions are being asked to respond to the need to provide students with the competencies necessary to cope in a rapidly changing environment.

--The cost of the technology is rapidly declining and is or will soon be within the reach of many. (Computer World, for example, reported that if the automotive industry had progressed at the same rate as the computer industry over the past 30 years, a Rolls Royce would cost $2.50 and get two million miles per gallon). The downward trend in the cost of computers and computer software is expected to continue.

--Computers are becoming "user friendly." As interaction with computers becomes simpler, use by the populace in general, will increase.

--Software is increasing in quantity and improving in quality.

We cannot ignore these developments as individuals, and certainly not as educators. Because the SDE is responsible for ensuring quality education with equity for all its students, a SDE Task Force was created to respond to the needs of local districts in the application of computer technology and its effects upon

1. planning a computer education program,
2. training staff and students,
3. selection of hardware,
4. selection of software,
5. curriculum development,
6. fiscal considerations, and
7. physical set-up and location of equipment.

We already know that computers can be used for the following:

- tutor computer-assisted instruction;
- entertainment - games, puzzles, mind teasers;

- artistic enterprises - color graphics, music synthesis;
- record keeping;
- word processing - composition of letters, reports, etc.;
- management - menu planning, control of electric appliances and burglar alarms, scheduling of television for children, planning trips and calculating the costs;
  planning an effective program.
- communications - stock market reports, electronic mail, major league sports scores, etc.;
- assistance to the physically handicapped.

As John Searles observed, "Today, forces are in motion in our society that are implacably marching on, shaping our daily lives. The growth of communications and informational technology will probably change the future world as much as the industrial revolution changed the world in the past." (FORUM)

In planning for computers in education, we as administrators and teachers must realize that success of the microcomputer and related technology in the classroom hinges on their proper management in the school setting.

This computer guide, therefore, has been written to assist you--the administrators and teachers in our state--to better manage the computer resources that you have or that you plan to acquire. The guide includes information on planning a computer education program, on selecting hardware and software, and includes a list of resources that will further asist you in planning an effective program.

CHAPTER I

PLANNING FOR A COMPREHENSIVE COMPUTER EDUCATION PROGRAM

Clearly, the computer revolution is having an impact on our schools. Many authorities contend that the computer is as much a revolution as the printing press; furthermore, learning and teaching will as a result, never be the same. The computer's influence on instruction has yet to be fully realized. It is expected that by the end of the 1980's, computers may take over some of the traditional teaching tasks, particularly the use of rule-based subject matter. Higher cognitive skills will remain the domain of teachers who will also have to manage students' interactions with computers. Thus, computers won't replace teachers, but they will change instruction in the classroom.

With the growing use of computers by society, the need to emphasize computer literacy in our schools becomes increasingly important. "Just what do we want our kids to know about computers" is an often asked question. Because our high school graduates will be in contact with various types of computing devices, graduating seniors will need to demonstrate a level of computer skill appropriate to the state of the art in his/her chosen field.

In order to meet the challenge presented by a rapidly advancing technology and the demands on schools that have arisen out of computer technology in particular, school districts must explore available options to determine what approach will best enable them to prepare students to cope with these changes. What to do about modifying our school curricula is a big decision that should be answered by teachers and administrators with cooperation and guidance from the local board of education.

It is strongly recommended that before any computer purchases are made, a task force of teachers and administrators be charged with developing a plan to integrate computers into the educational program. The plan need not be long nor involved; however, it should address a few key questions and possible answers which include the following:

1. For what will the computer be used?
   A. Management tasks, such as monitoring attendance, keeping student records, and managing budget.

B. Computer literacy to give students an understanding of computers as well as their application.

C. Computer-managed instruction to diagnose students' weaknesses, to provide teachers with suggestions for remediation and maintain records on individual student's progress.

D. Computer science to provide students with computer language training and the technical skills involved in operating and maintaining computers.

E. Information systems such as electronic mail and word processing.

F. Computer-assisted instruction to provide students with increased learning skills.

2. What training should staff receive?

We should not assume that all teachers need technological training in order to use computers effectively. Expert knowledge of programming and technical expertise represent a small portion of the required training. The main purpose of staff development should be to allow teachers and other staff to develop necessary skills to effectively facilitate students' learning with computers.

Trainers, preferably other teachers, should emphasize the fact that computers are simply an instructional tool. Teachers need not feel intimidated.

3. Where will computers be used?

Computer use will vary by level of schooling, and the nature of computer use will depend on the need at a given level. For example, it may be feasible to introduce all students to computers as part of a fifth grade mathematics course and provide drill and practice opportunities in reading for sixth graders and offer beginning programming in BASIC to eighth and ninth graders.

By all means, avoid limiting the use of computers to students who enroll in a computer programming class. Such a practice may deprive students and teachers of computer-supported instruction across all areas of the curriculum.

4. How will the computers be distributed across schools? programs?

Computers can support the instructional program if properly organized. If the budget allows the purchase of a limited number of computers, locate them in a central room. In this manner, a teacher can schedule himself/herself into this center and be an effective facilitator of learning with computers.

It should be noted that a computer room (center) approach entails careful attention to issues of facilities, logistics, and careful monitoring and scheduling of classes.

5. Have guidelines to evaluate hardware and software been developed?

Most educational software currently available is not adequate for classroom use. The pool of good software is getting larger, however. It is important to be able to tell the difference between the "good" and "not so good" software.

Sources for the review of software should also be tapped. A policy and procedures for the selection of software should ultimately be adopted. Guidelines will help. It would be wise to research existing software evaluation models and adopt these as needed. Prior to the purchase of hardware, some necessary precautionary steps should be taken. Keep the following in mind in evaluating software and hardware:

Evaluating Software

a. Look for local sales and service, including training from the people who know the software.
b. Buy software that does what you need, not what the vendor wants you to adapt to.
c. Read the documentation on the software before you see a demonstration of it s you'll get the most from the demonstration.
d. Thoroughly test the software at a site that is fully using it. Make sure you get hands-on testing.
e. Look for good error checking. If the software erases your program because you entered a wrong iter instead of asking you to enter the right item, it's too tricky.

f. Demand fast and flexible retrieval. If responses take more than a few seconds, the software isn't well designed.

g. Buy software that makes the computer do the work. If you have to keep switching back and forth between disks and tapes, or you have to enter information more than once, it means either the hardware or the software is inadequate--or maybe both.

h. Look for software that runs on different hardware. You'll have to assume the school will outgrow the computer sooner or later, and it would be a bonus to be able to move the software to a more sophisticated computer.

Evaluation Hardware

a. Check the quality of local sales and service. Call several customers of the prospective service organization. Count on signing up for a service contract, for one percent of the value of the equipment per month. (Computer manufacturers, incidentally, will also be donating peripherals and whatever software usually accompanies a sale).

b. Beware of new products. Let others be guinea pigs.

c. Look for durable construction and engineering to survive use by students and teachers. If it looks cheap on the outside, it might indicate the quality of engineering inside.

d. Allow for expansion. Either buy hardware that's expandable even if it's more costly, or buy the cheapest hardware that isn't expandable and plan to replace it in the next phase.

e. Look for well-documented systems software. Talk to a consultant or read a computer magazine. Also, get an evaluation of the language translator, whether it's BASIC or some other language.

f. Choose a system that serves a variety of languages. (HR 5573 specifies the donated machines must be able to handle three languages.)

g. Look for systems with a lot of available applications software. It's an indication that other people found the computer easy to work with.

h. Talk to owners and users of the systems you are considering, but don't expect them to say they made a mistake in their choice unless they're really unhappy.

i. Don't rush anything. "If everything takes three times as long as you expected, you are right on schedule."

j. Remember that all rules have exceptions, including these. (Taken from the October 11, 1982, Nation's Schools Report.)

6. What budget considerations should be made?

Critical mistakes are often made in this phase of planning. It is important not to overlook necessary budget components in planning for a computer education program. Some schools have purchased large amounts of hardware only to discover there is no money left for software. You are encouraged to construct a budget with proportionate shares for each of the following items:

A. hardware, including all peripherals;
B. software for all levels of the school program being planned for;
C. maintenance of the hardware;
D. supplies;
E. staff in-service costs;
F. insurance for the hardware;
G. support personnel - instructional, technical;
H. security measures;
I. expansion of the existing program (long range).

The plan for introducing and/or expanding a computer program has several other considerations which should be made. Goals are established to meet specific needs. Consequently, one of the first requirements for an appropriate plan for a school district is to conduct a needs assessment. Students' and staffs' needs have to be made known. Some questions which should be asked include the following:

- Have teachers had computer literacy training?
- Are teachers interested in using a computer for instruction? record keeping? programming?
- How familiar are teachers with different hardware brands? available instructional software?

- What percentage of the students
  1. have computers at home?
  2. have had little or no experience with computers?
  3. have been identified as gifted? need remedial services?

The questions, "Where do you perceive your school district's computer program to be in three or four years," and "What will it take to get you there," must be seriously considered in the planning stages. Goals must be tailored to specific school districts' needs. For example, a three-year computer program may include the following:

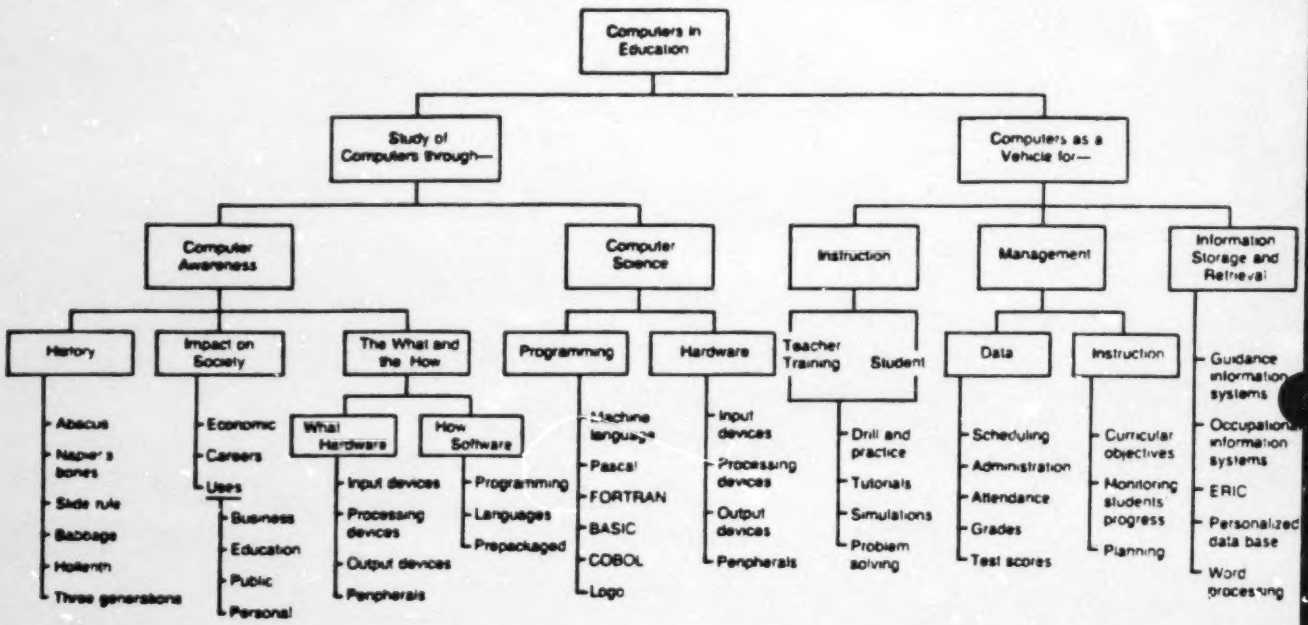
1. All staff members will have received computer literacy training.
2. Interested staff members will have received computer programming training.
3. All students will receive computer literacy training.
4. Computers will be used for instruction at all grade levels.
5. Computer programming will have be integrated into the junior high program.

With a long-range plan in place, the short-range goals can be more clearly developed. Another consideration that will ultimately have to be made is the development of an overall philosophy of computer education. The rapid proliferation of new technology will require a constant updating of this philosophy.

In summary, once the basic commitment has been made by the local school board and school administrators to incorporate microcomputers into the educational program, a school district must then proceed with a well-developed plan. And the driving force behind the planners is the knowledge that there is a group of eager students waiting to learn about and learn with computers.

An overview of microcomputers in education is presented below.

An overview of microcomputers in education



Note Although the two halves of the chart are visually balanced, in reality the areas they represent do not receive equal emphasis

CHAPTER II

EVALUATION/SELECTION OF SOFTWARE

Computer software is similar to gasoline for the automobile . . . programs are what "make it go." In the past microcomputers were bought without enough attention given to available software. Not only is quantity of software important, but quality should be equally considered. Programs should be "user friendly" so that they can be used with relative ease.

So much software that is on the market is not educationally sound. Approximately 15 percent of all software out there is good quality. General criteria for the selection of software was mentioned in Chapter I. What follows is 1) a comprehensive checklist of questions to consider before selecting software/courseware and 2) a list of sources of software reviews for your reference.

QUESTIONS

1. Is the courseware appropriate for your stated instructional goals and objectives?
2. Is the content accurate, complete, and sequential?
3. Does the courseware reading level correspond to that of the student?
4. What peripheral components are required for this courseware?
5. Is the courseware up to date? Will it go out-of-date?
6. What mode(s) of interaction are employed?
   a. Drill and practice (D & P)?
   b. Tutorial?
   c. Simulation/Games?
   d. Problem-solving?
   e. Exploration?
7. Is the use of graphics appropriate or annoying? Do the graphics fit with your instructional content? Do they enhance retention and facilitate recall? Are there any graphics at all, and do you want them?
8. Are cues or prompts used to stimulate recall before a response is given?

9. Action on the screen--is it appropriate, and can it be shut off?
10. Does the student have control over the following things:
    a. Time to solve a problem?
    b. Rate that display material is presented so the user can read at a comfortable pace?
    c. Sequence of the program - is the learner confined to a linear sequence, or is it possible to jump ahead or backwards (branching)?
    d. Where must entry into the program begin?
    e. Can you exit at any time?
    f. Options available: help, escape, hint, return to menu, return to instructions, etc.?
    g. Revision of work previously completed?
11. Are explanations provided on why incorrect responses are unacceptable?
12. Feedback - research shows that positive reinforcement of correct answers is <u>less</u> effective than a diagnostic study of incorrect responses in the <u>acquisition of instruction</u> (tutorial). The main function is to locate errors and provide information so the learner can get them right - <u>not</u> necessarily to strengthen or reinforce correct response! Does this software conform to the research?
13. Are incorrectly spelled answers accepted? Is a spelling error corrected in feedback? What happens when the student's input is not recognized by the computer?
14. What entry level skills are prerequisites to use?
15. Has the courseware been previously evaluated? Are results available?
16. Does the teacher/student manual complement the courseware?
17. Is the developer/vendor name and address available for questions, recommendations, or problems? Is "backup" software provided at a reduced price? Is validation data available from the vendor?
18. Is the courseware cost effective?
19. Does the courseware record student achievement for teacher retrieval?

20. Can courseware which is color-capable be used with a non-color monitor without impairment of effectiveness?

21. Packaging - Is there long term protection of the software?

22. Have teachers used and approved the software?

Unlike most other forms of instructional media, microcomputer software is not compatible from one brand of microcomputer to another; therefore, if the user already owns a microcomputer, certain constraints relative to software selection must be recognized. If a microcomputer is not owned, hardware selection and software selection may be made as a joint decision. One should not be misled by the fact that a particular software company may be selling the same program for several brands of microcomputers. While the end product will be the same, the specific item purchased will be made to run only on the type of microcomputer for which it is programmed. One must also insure that the microcomputer owned has the memory capacity to accommodate the program being purchased.

SOURCES OF SOFTWARE REVIEWS

Most computer users are not expert software evaluators, nor do they have much time to evaluate the vast quantity of available software. The computer user may find it advantageous to read existing courseware reviews and/or contact software clearinghouses for written evaluations of instructional software. What follows is a list of select journals, indexes, and software clearinghouses that review and evaluate instructional software on a regular basis.

A. CLEARINGHOUSES
   1. EPIE
   2. MICROSIFT
   3. TERC SOFTWARE EXCHANGE

B. INDEXES
   1. SCHOOL MICROWARE REVIEWS

C. JOURNALS
   1. CLASSROOM COMPUTER NEWS
   2. COMPUTING TEACHER
   3. CREATIVE COMPUTING

4. EDUCATIONAL COMPUTER MAGAZINE
5. ELECTRONIC CLASSROOM
7. ELECTRONIC LEARNING
8. INTERACTIVE COMPUTING
9. JOURNAL OF COMPUTER-BASED INSTRUCTION
10. JOURNAL OF COURSEWARE REVIEW
11. LEARNING
12. MICROCOMPUTERS IN EDUCATION
13. MICRO-SCOPE

D. DATA BASED SYSTEMS (SOFTWARE LIBRARIES)

1. The Source
   Tele-Computer Corporation
   1616 Anderson Road
   McLean, VA 22012
2. Main Software Library
   P.O. Box 197
   Standish, ME 04084
3. Computer Using Educators
   W. Don McKell
   Independence High School
   1776 Education Park Drive
   San Jose, CA 95133
4. MECC Instructional Services Division
   (Apple II Library)
   2520 Broadway Drive
   Lauderdale, MN 55113
5. Basic Programs for Educators
   (Apple, Pet TRC) CONDUIT
   University of Iowa
   Iowa City, IA 52242
6. The Atla Experience Micropower and Light Company
   1108 Keystone Department C
   13773 North Central Expressway
   Dallas, TX 75243

7. COMPUSERVE (Data Bank)
   Compuserve
   5000 Arlington Center Boulevard
   Columbus, OH 43220
8. Mead Data Central (Interactive news retrieval system)

E. BIBLIOGRAPHIES AND REFERENCE MATERIAL

1. CRLT University of Michigan
   109 East Madison Street
   Ann Arbor, MI 48104
2. Computing Newsletter - annual bibliography
   University of Colorado
   Colorado Springs, CO 80907
3. Search of Educational Software for the Apple
   Mr. John Wernegreen
   Eastern Kentucky University
   Department of Natural Sciences
   220 Memorial Science
   Richmond, KY 40475
4. School Micro Ware
   (A directory of instructional microcomputer
   software for Radio Shack, Pet, Apple II)
   Dresden Associates
   P.O. Box 246
   Dresden, ME 04342
5. Periodical Guide for Computerists
   (An annual index of personal computing magazine articles)
   Berg Publications
   14751 112th Avenue NE
   Kirkland,WA 98033

New sources of information about this field are increasingly available. Educators concerned with the selection of courseware should make every effort to be aware of and become familiar with them.

CHAPTER III

SELECTION OF HARDWARE

Educators are encouraged to research the plethora of available information about computer hardware before a major investment is made. Most school districts have already purchased hardware for instructional use. To those educators who have had the opportunity to explore the world of computer-assisted learning, it is evident that "hardware should be software driven." Though available software is not the only major consideration that should precede the purchase of hardware, it is among the most important.

The list which follows contains criteria for selecting microcomputer hardware. This list is by no means complete but contains the basic considerations that a school district should make before purchasing hardware.

1. Communications capabilities
2. BW/color availability
3. Editing capabilities
4. Graphics resolution
5. Hardware cost (price)
6. Adaptability for instructional use
7. Interfacing capabilities
8. Languages available
9. Maintenance requirements
10. Memory availability and expansion
11. Number of output posts
12. Peripherals available, needed
13. Portability
14. Availability of reference manuals
15. Availability of software
16. Function keys capabilities
17. Sound/music capabilities
18. System expansion capabilities
19. Execution time and loading speed
20. Service availability

CHAPTER IV

COMPUTER RESOURCES FOR NEW MEXICO EDUCATORS

The following section lists a number of resources that may be helpful to New Mexico educators who are planning or implementing educational programs in which computers are used.

Included is information about books and data bases, video tapes, periodicals, and associations and organizations that deal with the topic of educational computing. Also listed are the names of several New Mexico educators who can offer their services as resource people and a list of computer bibliographies available through the Educational Resource Center of the State Department of Education.

BOOKS

COMPUTERS: A COMPREHENSIVE GUIDE - Published by Yes!, Inc. - 56pp

In this Comprehensive Guide 819 titles about computers are critically reviewed. The reviews indicate the strengths and weaknesses of the books and the kind of information they cover. A good reference to consult when considering the purchase of a book(s) about computers.

To obtain a copy, send $2.00 to:
Yes! Book Shop
1035 31st Street, NW
Washington, DC 20007
Telephone: (202) 338-2727

BOOKS (Continued)

THE EDUCATOR'S UNAUTHORIZED MICROCOMPUTER SURVIVAL MANUAL - by Marcella Pitts, 58pp

This concise, very readable book may be a helpful guide for educators who are in the planning stages in determining how to use microcomputers in their school(s).

As the introduction states, "The Survival Manual is for anyone who must decide when, where, how, and even whether to use microcomputers in school.... Why a survival manual? Because there are many pitfalls as promises in using computers in schools. Why unauthorized? Because the manual delivers a message different than those coming from technology enthusiasts in government and commerce."

For a copy of the Survival Manual or ordering information, contact:
Marcella Pitts
Cedar, Suite 206
1518 H Street, NW
Washington, DC 20005
Telephone: (202) 683-3193

MICROCOMPUTERS IN EDUCATION: AN INTRODUCTION - by Adeline Naiman, 76pp

This book is intended to help novices in the educational use of microcomputers, whether they are superintendents or teachers, school board members, parents, or interested citizens. The book includes chapters on planning, application, hardware and software selection, teacher education and program evaluation. An appendix lists a number of resources. The book is co-published by the Technical Educational Research Center, Inc., and Northeast Regional Exchange, Inc.

BOOKS (continued)

To order a copy of this publication, send $5.00 plus $1.00 shipping to:

Northeast Regional Exchange, Inc.
101 Mill Road
Chelms Ford, MA 01824
Telephone: (617) 256-3987

INTRODUCTION TO COMPUTERS IN EDUCATION FOR ELEMENTARY AND MIDDLE SCHOOL TEACHERS - by David Moursund - 94pp

This book is designed to help increase the reader's level of computer education literacy. It can be used in a formal course for inservice or preservice of teachers, or it can be used for self-instruction.

The book discusses the capabilities, limitations, applications, and possible impact of computers in education. It contains a broad general overview of hardware, software, courseware, and computer related information that teachers need to know.

To order a copy, send $7.00 to:

International Council for Computers in Education
Department of Computer and Information Science
University of Oregon
Eugene, Oregon 97403

A QUICK REFERENCE GLOSSARY OF COMPUTER TERMINOLOGY - by Educational Research Service, Inc. - 32pp

One of the most frequent problems educators face in planning for computer applications in education is trying to understand "computerese." The vocabulary used in discussions about computer hardware and software often seems foreign and incomprehensible. What, for example, is daisy wheel or a dot matrix printer? And what is the difference between a smart terminal and a dumb terminal?

BOOKS (continued)

This glossary is designed to be an easy reference of the many terms of interest to school officials responsible for making decisions regarding the use and purchase of computer hardware and software. Examples specific to school administrators and instruction are included whenever possible.

The Glossary may be obtained from:
Educational Research Service, Inc. (ERS)
1900 North Kent Street
Arlington, Virginia 22209
Telephone: (703) 243-2100
The cost of the Glossary is $10.00, half price to ERS subscribers.

A HANDBOOK FOR PROSPECTIVE AUTHORS OF COMPUTER ASSISTED INSTRUCTION SYSTEMS - 20pp
TOWARD EXEMPLARY COURSEWARE - 22pp - both by Computer Thought Corporation

These reports, sponsored by the U. S. Department of Education, are geared to those educators who are interested in designing their own courseware.

The first, A Handbook for Prospective Authors, "provides prospective authors of educational software with background information pertaining to computer assisted instruction (CAI) and, in particular, serves as a guide to the successful transfer of an instructional program from traditional written form into a working computer program."

Toward Exemplary Course "describes the analysis of a set of existing educational courses that have been shown to be effective in noncomputer settings. The focus of the analysis was to determine what aspects of these courses make them effective, and to what extent they could be converted to an equivalent CAI system while retaining (or expanding) their educational power. A set of criteria for evaluating these and other educational materials from the perspective of CAI implementation is also presented."

Copies of the reports may be obtained by contacting:
U. S. Department of Education
1200 Main Tower Building
Dallas, Texas 75202

THE USE OF A COMPUTER TO HELP TEACH THE SCHOOL CURRICULUM - 42pp
A Joint Project of: Minnesota Assoc. for Supervision & Curr. Dev.
Minnesota Association of School Administrators
Minnesota Department of Education

Educators from the State of Minnesota have been in the forefront in developing ways to use microcomputers in the schools.

"This document is designed to be used by any school person (teacher, administrator, school board member) in a position to make decisions for a district about the future use of computers. It illustrates a systematic way of defining curriculum, selecting software and hardware, developing materials and then implementing the materials chosen. This document will serve as guide for making informed and logical computer decisions."

For a copy of this publication, please contact:
Jean Padilla
Educational Resource Center
New Mexico State Department of Education
Education Building
Santa Fe, New Mexico 87501-2786
Telephone: (505) 827-6504

EVALUATION OF EDUCATIONAL SOFTWARE - A GUIDE TO GUIDES - by the Northeast Regional Exchange and The Southwest Education Development Laboratory - 95pp

This publication comes highly recommended by the New Mexico State Department of Education. It is an invaluable guide for educators involved in the costly and often confusing business of selecting educational software (or courseware, as it is also referred to). The Guides goal is to provide awareness, understanding, and reference information about the evaluation of software.

BOOKS (Continued)

Specifically, this document is intended to:

- Present suggested processes for making informed software selections,
- Provide awareness of several prominent models for software evaluation (including MicroSift, EPIE, Courseware Report Card and several others),
- Raise key issues in the software selection process, and
- Provide information on a variety of print and organizational resources that may be useful to those making software decisions.

To obtain the Guide, please write to:

Office of Institutional Communications
Southwest Educational Development Laboratory
211 East 7th Street
Austin, Texas 78701
Telephone: (512) 476-6861

1-9 copies	$6.50 each
10-99 copies	$5.50 each
100+ copies	$5.00 each

RESOURCES IN COMPUTER EDUCATION (RICE) - Northwest Regional Exchange Lab

RICE is a comprehensive data base of information about microcomputer courseware for use in elementary and secondary education. It contains information about some 2,000 microcomputer courseware items, including descriptions and evaluations. RICE also has files on producers and developers of software, computer literacy, descriptions of school projects in computer applications, and an inventory of hardware installed in schools.

The RICE data base is installed on the BRS (Bibliographic Retrieval Services) national computer network.

To obtain additional information about RICE, contact:

Northwest Regional Educational Laboratory
300 Southwest Sixth Avenue
Portland, Oregon 97204

BOOKS (continued)

To access the RICE data base, contact:
Jean Padilla
Educational Resource Center
New Mexico State Department of Education
Education Building
Santa Fe, New Mexico 87501-2786
Telephone: (505) 827-6504

TECHNOLOGY PROGRAMS - by the National Diffusion Network, U. S. Department of Education - 31pp

This mini-catalog of the National Diffusion Network (NDN) lists 25 programs in the area of educational technology and includes a brief description of each program. As with all NDN programs, these have been nationally validated by the Joint Dissemination Review Panel (JDRP) of the U. S. Department of Education. In other words, they have been field tested, evaluated, and proven to be effective.

In some cases training materials and technical assistance are available to schools which may be interested in adopting one of these projects.

To obtain a copy of this publication or to get further information about the service available through the NDN, contact:
DEEP Project
New Mexico State Facilitator
Department of Educational Foundations
College of Education
University of New Mexico
Albuquerque, New Mexico 87131
Telephone: (505) 277-5204

COMPUTER EDUCATION VIDEO TAPES

by National Diffusion Network (NDN)

This series of 16 video tapes, produced by the NDN in conjunction with the Horace Mann Learning Center in Washington, DC, provides an overview of computers and their uses in education and were designed to assist in the inservice training of educators. A sample of the titles include:

- Introduction to the Computer and Its Use in Education
- Computer Literacy: A New Subject in the Curriculum
- Using the Computer to Develop Writing Abilities
- Teacher Training
- Software Development: Key Issues and Considerations

Tapes are priced at $40.00 each or $600.00 for the entire set.

To obtain further information contact:

CLT Media Distribution Network and Computer Training Labs
Cultural Education Center
C-7 Concourse Level
New York State Education Department
Albany, New York 12230
Telephone: (518) 474-5823

PERIODICALS

The following is a list of journals and magazines that deal with the topic of computer application in education:

CLASSROOM COMPUTER NEWS

Emphasis is on using sound educational techniques in the classroom. Six issues yearly. Published by Intentional Educations, Inc., 341 Mt. Auburn Street, Watertown, MA 02172.

THE COMPUTING TEACHER

Designed for educators interested in the instructional uses of computers. Includes regular reviews of software. Nine issues per year. Published by the Department of Computer and Information Science, University of Oregon, Eugene, OR 97403.

CREATIVE COMPUTING

Applications and software magazine for home, business and education. Evaluations of hardware and software. Monthly. P.O. Box 789-M, Morristown, NJ 07960.

EDUCATION COMPUTER

Publication for teachers on using computers, especially microcomputers, in the classroom. Bi-monthly. P.O. Box 535, Cupertino, CA 95015.

EDUCATIONAL TECHNOLOGY

Oriented toward a general educational use of technology. Each issue has articles about educational computing. Monthly. Published by Education Technology Publications, 140 Sylvan Avenue, Englewood Cliffs, NJ 07632.

THE ELECTRONIC CLASSROOM

Each issue contains detailed evaluations of software designed for classroom use. Monthly. 150 West Carob Street, Compton, CA 90220

ELECTRONIC EDUCATION

Covers issues and applications of educational use of computers. Each issue contains a detailed review of a computer system or instructional package. Ten issues yearly. Published by Electronic Communications, Inc., Suite 220, 1311 Executive Center Drive, Tallahassee, FL 32301

PERIODICALS (continued)

ELECTRONIC LEARNING

A well written magazine that provides information about developments in electronic learning, especially computers. Each issue contains software reviews. Bimonthly. Published by Scholastic, Inc., 902 Sylvan Avenue, P.O. Box 2001, Englewood Cliffs, NJ 07632.

T.H.E. JOURNAL

Technological Horizons In Education (T.H.E.) Journal discusses both the theoretical and practical aspects of education technology. Bi-monthly. Published by Information Synergy, Reader Service Department, P.O. Box 992, Acton, MA 01720.

ORGANIZATIONS AND ASSOCIATIONS

The following listings and descriptions are taken from a mini-list that was compiled by the Resource and Referral Service (RRS) which is part of the Research and Development Exchange, sponsored by the National Institute of Education.

INTERNATIONAL COUNCIL FOR COMPUTERS IN EDUCATION (ICCE)

ICCE is a nonprofit professional organization dedicated to improving the instructional use of computers. The Computing Teacher is a journal for people interested in the instructional use of computers at the precollege level. It deals with teaching how to use computers, teaching about computers, and the impact of computers upon the general curriculum.

Among instructional booklets available are: The School Administrator's Introduction to Instructional Use of Computers designed for school administrators and school board members who have little experience with computers. The booklet provides a series of questions and answers about the instructional use of computers and on what could or should be going on in the schools. The Teacher's Guide to Computers in the Elementary School is designed to help elementary school teachers with little formal computer training to gain an initial level of computer literacy. Additional booklets on other topics of interest to teachers are available.

For further information, contact:
Department of Computer and Information Science
University of Oregon
Eugene, OR 87403
Telephone: (503) 686-4408

MINNESOTA EDUCATION COMPUTING CONSORTIUM (MECC)

MECC is an organization created to coordinate and provide computer services to students, teachers, and education administrators throughout the state of Minnesota. A Documentation Center makes available written materials ranging from a periodic newsletter to curriculum guides that can be used to

help implement computer use in the classroom. The newsletter, "Network," lists available diskettes, support booklets for these diskettes, and programming and reference manuals. The newsletter is sent free upon request.

For further information, contact:

MECC
3490 Lexington Avenue North
St. Paul Minnesota 55112
Telephone: (612) 638-0600

MICROCOMPUTER SOFTWARE AND INFORMATION FOR TEACHERS (MicroSIFT)

MicroSIFT serves as a clearinghouse for microcomputer K-12 instructional software information. The major foci are on establishing effective procedures for the collection, evaluation, and dissemination of materials and information, and on providing user support and technical assistance. Additional information is available through the MicroSIFT News, a quarterly newsletter.

To be placed on the MicroSIFT News mailing list, and for additional information, contact:

Northwest Regional Educational Laboratory (NWREL)
300 Southwest Sixth Avenue
Portland, OR 97204
Telephone: (503) 248-6800, Ext. 437

ASSOCIATION FOR EDUCATIONAL DATA SYSTEMS (AEDS)

AEDS is a professional organization for those interested in computers in education. AEDS produces three quarterly publications - the AEDS BULLETIN, a newsletter which focuses on interchapter communications and meeting announcements; the AEDS MONITOR which contains short timely articles on current directions in educational data systems; the AEDS JOURNAL which contains

articles illustrating the latest developments in the application of computer technology to all areas of education. An individual membership includes a subscription to all three publications.

For further information, contact:
Association for Educational Data Systems (AEDS)
1201 Sixteenth Street NW
Washington, DC 20036
Telephone: (202) 883-4100

ASSOCIATION FOR DEVELOPMENT OF COMPUTER-BASED INSTRUCTIONAL SYSTEMS (ADCIS)

ADCIS is an international, nonprofit organization representing elementary and secondary school systems, colleges, universities, business, industry, and military and government agencies. The purposes of ADCIS include advancing the investigation and utilization of computer-based instruction (CAI) and/or managing, promoting and facilitating the exchange of information, programs and materials; reducing redundant efforts among developers; and specifying requirements and priorities of hardware and software development.

The ADCIS NEWS is a bimonthly newsletter mailed to all members. THE JOURNAL OF COMPUTER-BASED INSTRUCTION is a scholarly journal that is published four times a year. ADCIS has several Special Interest Groups including ones for Plato Users, Mini/Microcomputer Users, Elementary/Secondary/Junior College, and Interactive Instructional System Presentation and Authority (IISPA).

For further information, contact:
ADCIS Headquarters
Computer Center
Western Washington State University
Bellingham, WA 98225
Telephone: (206) 676-2860

SOCIETY FOR APPLIED LEARNING TECHNOLOGY (SALT)

SALT is a nonprofit professional organization for the purpose of education and scientific advancement. Membership is oriented to professionals in the area of instructional technology. Members receive the quarterly NEWSLETTER. Other publications include the JOURNAL OF EDUCATION TECHNOLOGY SYSTEMS, MICROCOMPUTERS IN EDUCATION AND TRAINING; and VIDEODISC, MICROCOMPUTER AND LEARNING SYSTEM TECHNOLOGIES IN PUBLIC, VOCATIONAL, MEDICAL AND HANDICAPPED EDUCATION AND TRAINING.

For further information, contact:
Society for Applied Learning Technology (SALT)
50 Culpepper Street
Warrenton, VA 22186
Telephone: (703) 347-0055

CONDUIT

CONDUIT is a source of instructional materials and a research and development center. Its biannual publication, PIPELINE, is a source of information about the use of computers in higher education. While all CONDUIT software is written for college use, some is appropriate for advanced high school science and math classes. CONDUIT welcomes software submissions, with the caveat that programs must be suitable for post-secondary instruction. Detailed author guidelines are available.

For further information, contact:
CONDUIT
P.O. Box 388
University of Iowa
Iowa City, Iowa 52244
Telephone: (319) 353-5789

COMPUTERTOWN, USA!

COMPUTERTOWN, USA! is a computer literacy project of the people of Menlo Park, the Menlo Park Library, and the People's Computer Company, a nonprofit education corporation in Menlo Park. The goals of this National Science Foundation-funded project are to develop, test, and evaluate a set of course materials and operating procedures for a transportable model of a microcomputer-based community literacy project. Emphasis is given to using local community resources. The courseware is based on a series of six-week classes for children and adults dealing with introductory materials, BASIC programming, and project-based programming experiences. Courseware includes student workbooks, teacher guides, handouts, and lists of recommended software that complement the class activities. Courseware will be available for dissemination in late 1983. A free newsletter, COMPUTERTOWN, USA! NEWS BULLETIN, is published monthly.

The BULLETIN can be received by writing to:
Computertown, USA!
P.O. Box E
Menlo Park, CA 94025
Telephone: (415) 327-0541

NEW MEXICO COUNCIL OF COMPUTER USERS IN EDUCATION (NMCCUE)

NMCCUE is a nonprofit, statewide organization composed of educators at all levels, business and industry trainers and other interested indivduals. The organization was formed out of an evident need for an information gathering and dissemination organization that would encourage and actively facilitate the development of computer applications in education in both the public and private sector.

THE ORGANIZATION:

- Maintains a directory which lists individuals and organizations using computers in education, thereby encouraging contacts for the exchange of software and expertise,

ORGANIZATIONS AND ASSOCIATIONS (Continued)

- Supports training and technical assistance workshops to link New Mexico expertise with local school districts, universities, and private organizations;
- Serves as an advocate for the development of systematic planning, curriculum guidelines and standards for the instructional use of computers through contacts and state agencies.

To obtain information about NMCCUE, contact:
Dr. Phil Barck, President
NMCCUE Board of Directors
Los Alamos Public Schools
P.O. Drawer 90
Los Alamos, NM 87544
Telephone: (505) 662-4141

COMPUTER RESOURCE PEOPLE

Within the State of New Mexico there are many people who have had considerable experience in the educational application of computer technology. Several of these people have indicated a willingness to offer services to New Mexico educators. The names and addresses of these resource people are listed below. This is by no means an exhaustive list.

Timothy J. Pettibone, Professor of Education
Department of Education, Management and Development
New Mexico State University
Las Cruces, New Mexico 88003
Telephone: (505)646-3039
Services offered: bid preparation, planning, implementation, administrative/ curriculum applications

Terry Othick, Director of Technological Services
Information Systems Department
Public Service Company of New Mexico
Alvarado Square
Albuquerque, New Mexico 87158
Telephone: (505) 848-2700
Services offered: personal computers - current and future applications, how to justify the acquisition of microcomputers, the microcomputers role in schools and corporations, the micro-mainframe interface

Rudy Miller and/or Betsy Janssen
Career Enrichment Center
Albuquerque Public Schools
807 Mountain Road, NE
Albuquerque, New Mexico 87102
Telephone: (505) 243-3563

COMPUTER RESOURCE PEOPLE (Continued)

Services offered: purchasing computers, curriculum development, literacy, computer assisted instruction (CAI), computer science, administrative use of computers

Karen P. Gentry
1602 Westridge Road
Carlsbad, New Mexico 88220
Telephone: (505) 827-3511; 9987
Services offered: aid in the development of high school computer science curriculum

James Day
3507 Kayenta Drive
Farmington, New Mexico 87401
Telephone: (505) 622-8317
Services offered: inservice in instructional applications, setting up computer labs

Bob Cosgrove
P.O. Box 1422
Silver City, New Mexico 88062
Services offered: hardware, software selection; relational data-base management systems and uses; spreadsheets

Robert Content, Director
International Space Hall of Fame
P.O. Box 533
Alamogordo, New Mexico 88310
Telephone: (505) 437-2840
Services offered: teacher training, summer camp for students, starting a microcomputer educational program evaluation of hardware and software

COMPUTER RESOURCE PEOPLE (Continued)

John Cantwell
Sandia National Laboratories
Community Relations Division 3163
P.O. Box 5800
Albuquerque, New Mexico 87185
Services offered: computer related issues and planning for local boards of Education

Dr. Peggy J. Blackwell
University of New Mexico
College of Education
Albuquerque, New Mexico 87131
Telephone: (505) 277-2231
Services offered: evaluation, curriculum development, testing

Dr. Phil H. Barck
Coordinator of Research Evaluation
and Data Processing
Los Alamos School District
P.O. Drawer 90
Los Alamos, New Mexico 87544
Telephone: (505) 662-4141
Services offered: organizing for implementation of computers in education, teacher inservice, curriculum development

COMPUTER BIBLIOGRAPHIES

The following bibliographies may be obtained from the Education Resource Center of the State Department of Education:

1) ERIC - COMPUTER SEARCH REPRINT - June, 1983
"Computers in the Preschool and Elementary School" - 99 citations

2) ERIC - COMPUTER SEARCH REPRINT - August, 1982
"Computer Assisted Instruction for Handicapped Children and Youth" - 104 citations

3) INFO SEARCH - June, 1982
"Microcomputers: Elementary/Secondary Education" - 50 citations

4) MICROCOMPUTERS IN SPECIAL EDUCATION - 1982 - 19 listings

5) COURSEWARE EVALUATION MATERIALS - September, 1983
Materials that are available in the State Department of Education, Educational Resource Center - 36 listings

6) CITE Resource Bibliography on Computers in Education Update (1983) 146 listings

To obtain copies of bibliographies, contact:

Jean Padilla
Educational Resource Center
New Mexico State Department of Education
Education Building
Santa Fe, New Mexico 87501-2786
Telephone: (505) 827-6504